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WHAT IS CLAIMED

~~Claims.~~

- 10 1. A thin-walled component comprising a superfine cement matrix and at least one compressed steel wool mat embedded in the superfine cement matrix.
- 15 2. A component as claimed in claim 1, characterized in that the main surfaces of the component are virtually free of steel wool fibers.
- 20 3. A component as claimed in claim 1 and/or 2, characterized in that the main surfaces of the component are smooth and essentially superfine cement material is present on the surfaces.
- 25 4. A component as claimed in one or more of claims 1 to 3, characterized in that a plurality of superposed, compacted steel wool mats are present therein.
5. A component as claimed in claim 4, characterized in that the steel wool mats are arranged so that the main directions of the steel wool fibers of the steel wool mats cross.
- 30 6. A component as claimed in one or more of claims 1 to 5, characterized by a content of steel wool mats of from 2 to 10% by volume, in particular from 4 to 8% by volume.
- 35 7. A component as claimed in one or more of claims 1 to 6, characterized by a thickness of from 3 to 10 mm, in particular from 4 to 8 mm.

8. A component as claimed in one or more of claims 1 to 7, characterized by a bending tensile strength of from 25 to 80 N/mm², in particular from 50 to 75 N/mm².

5 9. A component as claimed in one or more of claims 1 to 8, characterized by a compressive strength of from 30 to 75 N/mm², in particular from 45 to 60 N/mm².

10 10. A component as claimed in one or more of claims 1 to 9, characterized in that the component is colored by means of pigments.

11. A component as claimed in one or more of claims 1 to 10, characterized in that the component has a curved shape.

12. A component as claimed in one or more of claims 1 to 11, characterized in that the component has a shuttering structure on its main surfaces.

13. A component as claimed in one or more of claims 1 to 12, characterized in that the steel wool fibers of the steel wool mats have a mean fiber diameter of from 0.05 to 0.20 mm, in particular from 0.08 to 0.12 mm.

14. A component as claimed in one or more of claims 1 to 13, characterized in that the steel wool mats have a weight per unit area of from 600 to 2000 g/m², in particular from 700 to 1100 g/m².

15. A component as claimed in one or more of claims 1 to 14, characterized in that the steel wool fibers have a length/diameter ratio of over 1000.

16. A component as claimed in one or more of claims 1 to 15, characterized in that the

superfine cement matrix comprises microsilica in amounts of from 0 to 30% by mass, in particular from 5 to 15% by mass.

17. A component as claimed in one or more of claims 1 to 16,
5 characterized in that the superfine cement matrix comprises pigments in amounts of from 0 to 5% by mass, in particular from 1 to 3% by mass.

18. A component as claimed in one or more of claims 1 to 17,
10 characterized in that the superfine cement matrix comprises inert mineral materials in amounts of from 0 to 70% by mass, in particular from 10 to 30% by mass.

19. A component as claimed in one or more of claims 1 to 18,
15 characterized in that the superfine cement matrix comprises quartz flour in amounts of from 0 to 70% by mass, in particular from 10 to 30% by mass.

20. A component as claimed in one or more of claims 1 to 19,
20 characterized in that the superfine cement matrix comprises superfine fly ash in amounts of from 0 to 50, in particular from 0 to 30.

21. A component as claimed in one or more of claims 1 to 20,
25 characterized in that the superfine cement matrix is a portland cement matrix.

22. A component as claimed in one or more of claims 1 to 21,
30 characterized in that the superfine cement matrix is a slag cement matrix.

23. A component as claimed in one or more of claims 1 to 22,
characterized in that the compressed steel wool mats are from 3 to 10 mm thick, in particular from 4 to 8 mm thick.

24. A process for producing a thin-walled component, in

particular a component as claimed in one or more of claims 1 to 23, characterized in that at least one steel wool mat is compressed perpendicular to its main elongation and is injected with and surrounded by a suspension based on superfine cement and in that the suspension is cured.

25. The process as claimed in claim 24, characterized in that a stainless steel wool mat is used.

26. The process as claimed in claim 24 or 25, characterized in that a steel wool mat in which the steel wool fibers have mean fiber diameters of from 0.05 to 0.20 mm, in particular from 0.08 to 0.12 mm, is used.

27. The process as claimed in one or more of claims 24 to 26, characterized in that a steel wool mat in which the fiber lengths are from 20 mm to a plurality of meters, on average a plurality of decimeters, is used.

28. The process as claimed in one or more of claims 24 to 27, characterized in that a steel wool mat whose fibers have a length/diameter ratio of over 1000 is used.

29. The process as claimed in one or more of claims 24 to 28, characterized in that steel wool mats having a weight per unit area of from 600 to 2000 g/m², in particular from 700 to 1100 g/m², are used.

30. The process as claimed in one or more of claims 24 to 29, characterized in that the steel wool mat or mats is/are compressed by from 10 to 20% of its/their thickness.

31. The process as claimed in one or more of claims 24 to 30,

characterized in that at least two steel wool mats are used and the main direction of the fibers of one steel wool mat is at an angle to the main direction of the fibers of the other steel wool mat.

32. The process as claimed in one or more of claims 24 to 31, characterized in that a superfine cement suspension based on slag sand + activators is used.

33. The process as claimed in one or more of claims 24 to 32, characterized in that a suspension based on superfine cement on the basis of portland cement is used.

34. The process as claimed in one or more of claims 24 to 33, characterized in that a superfine cement having a gradated particle size distribution and a d_{95} of $\leq 24 \mu\text{m}$, preferably $\leq 16 \mu\text{m}$, is used for producing the superfine cement suspension.

35. The process as claimed in claim 34, characterized in that a superfine cement having a mean particle size d_{50} of $\leq 7 \mu m$, in particular $\leq 5 \mu m$, is used.

36. The process as claimed in one or more of claims 24 to 35, characterized in that superfine cement is mixed with water and a highly effective fluidizer or flow improver.

37. The process as claimed in claim 36, characterized in that microsilica, particularly in the form of a dispersion, is mixed in.

38. The process as claimed in claim 36 or 37, characterized in that a pigment is mixed in.

39. The process as claimed in one or more of claims 36 to 38, characterized in that a mineral material having the same fineness as or a greater fineness than the superfine cements is mixed in.

40. The process as claimed in one or more of claims 36 to 39, characterized in that naphthalenesulfonate is used as highly effective fluidizer.

41. The process as claimed in one or more of claims 36 to 40, characterized in that a polycarboxylate is used as super-fluidizer.

42. The process as claimed in one or more of claims 24 to 41, characterized in that the following compositions are used for producing the suspension based on superfine cement:

Superfine cement:	from 30 to 100% by mass, in particular from 50 to 80% by mass;
Fluidizer or flow improver (liquid):	from 0.1 to 5% by mass, in particular from 0.5 to 4.0% by mass;
Fluidizer or flow improver (pulverulent):	from 0.1 to 2.5% by mass, in particular from 0.5 to 1.5% by mass;
Microsilica (slurry):	from 0 to 30% by mass, in particular from 5 to 15% by mass;
Pigments (pulverulent):	from 0 to 5% by mass, in particular from 1 to 3% by mass;
Inert mineral materials:	from 0 to 70% by mass, in particular from 10 to 30% by mass;
Superfine fly ash:	from 0 to 50% by mass, in particular from 10 to 30% by mass;

based on the solids content of the suspension.

43. The process as claimed in one or more of claims 24 to 42, characterized in that suspensions having a water/solids ratio of
5 from 0.4 to 0.6 are used.

44. The process as claimed in one or more of claims 24 to 43, characterized in that suspensions having a consistency, measured as the Marsh outflow time, of from 35 to 75 seconds are used.

10 45. The process as claimed in one or more of claims 24 to 44, characterized in that the suspensions are produced by placing the amount of water required in a mixing vessel and adding the fluidizer or flow improver while mixing, then adding the
15 previously weighed out dry materials and continuing to mix and thus homogenize the mixture.

20 46. The process as claimed in one or more of claims 24 to 45, characterized in that the steel wool mats are compressed between sealed shuttering and the superfine cement suspension is injected under pressure into the shuttering, with an air outlet being provided so that the air can escape from the space within the shuttering during injection.

25 47. The process as claimed in claim 46, characterized in that injection is carried out in a direction opposite to that of gravity.

30 48. The process as claimed in one or more of claims 24 to 47, in particular as claimed in claim 44 or 45, characterized in that components having a thickness of ≤ 10 mm are produced.

49. The use of a component as claimed in one or more of

claims 1 to 23 and produced as claimed in one or more of claims 24 to 46 as roof and/or exterior wall and/or wall cladding.

50. The use of a component as claimed in one or more of claims 1 to 23 and produced as claimed in one or more of claims 24 to 46 as sheathing or cladding for components to be protected or to be covered.

51. The use of a component as claimed in one or more of claims 1 to 23 and produced as claimed in one or more of claims 24 to 46 in the form of half shells for producing and sheathing channels, pipes or the like.

52. The use of a component as claimed in one or more of claims 1 to 23 and produced as claimed in one or more of claims 24 to 46 as a sandwich element for producing fire doors.

53. The use of a component as claimed in one or more of claims 1 to 23 and produced as claimed in one or more of claims 24 to 46 as external skin for steel-reinforced concrete components.

54. The use as claimed in claim 53, characterized in that the external skin is lost shuttering.

55. The use of a component as claimed in one or more of claims 1 to 23 and produced as claimed in one or more of claims 24 to 46 as lost shuttering.

56. The use of a component as claimed in one or more of claims 1 to 23 and produced as claimed in one or more of claims 24 to 46 as repair material, wherein faulty areas and/or hollows in damaged concrete surfaces are stuffed with at least one steel wool mat, the mat is compressed and subsequently shuttered, sealed and the suspension is injected.

